



INTESTINAL GIARDIASIS IN CHILDREN

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Annotation: *Giardiasis has a global distribution and it is a common cause of diarrhea in both children and adults and is transmitted via the fecal-oral route through direct or indirect ingestion of cysts. The laboratory diagnosis of Giardia spp. is mainly based on demonstration of microscopic cyst or trophozoite in stool samples but several immunological-based assays and molecular methods are also available for giardiasis diagnosis. The aim of this study was to conduct a review of the applied methods in medical laboratory and to highlight pitfalls and challenges of them for diagnosis of giardiasis. In this article we have evaluated the Giardia diagnostic methods with a broad review of literature, electronic databases and books. The search has covered the articles and some textbooks that have published up to 2018.*

It has been concluded that traditional microscopy combination with stool concentration method should still be held in the routine medical laboratory due to economical and high sensitivity and immunological-based assay and molecular methods which are recommended to use as a complementary test to the traditional technique.

Giardiasis is highly prevalent in children and is often mildly symptomatic. First-line treatment is metronidazole, but treatment failure is not uncommon. We describe a paediatric series, to identify risk factors for treatment failure and to analyse the safety and effectiveness of other treatment strategies.

Key words: giardia, diagnosis, methods, metronidazole.

Introduction.

Giardia intestinalis (GI) is an intestinal parasite with global distribution, considered the most prevalent pathogenic protozoa infection in the world. Children, travellers and immunocompromised patients are at higher risk of infection, especially those from areas with limited water treatment and poor sanitary conditions, given transmission occurs by ingestion of cysts from contaminated food or water [1,2]. The estimated prevalence of giardiasis reaches 20%–40% in resource-limited settings and is higher in children younger than 5 years of age [1]. In Spain, a study addressing travellers' diarrhoea in children found a prevalence of 10% [3]. In 2004, giardiasis was included in the World Health Organization Neglected Diseases Initiative [2].

Among children, most cases are mild or barely symptomatic; however, the clinical presentation can include acute or chronic diarrhoea, abdominal distension and intestinal malabsorption, which can lead to anaemia and contribute to stunting and malnutrition in the long term [4,5]. Some studies have suggested that giardiasis might induce lactose intolerance or postinfectious irritable bowel syndrome [6]. There is vast evidence associating giardiasis with long-term consequences, from subclinical or chronic malnutrition to cognitive retardation, vitamin and iron deficiency and chronic fatigue [4,7, 8, 9, 10]. Together with the potential of transmission, these long-term consequences of giardiasis highlight the need to rule out infection in children coming from areas with limited water treatment and poor sanitary conditions, even in asymptomatic cases.

According to most guidelines, first-line treatment for giardiasis in children is metronidazole, at a dose of 15 mg/kg/day every 8 hours for 5–7 days [11]. Despite evidence suggesting that single-dose tinidazole is the best available treatment for giardiasis in symptomatic and asymptomatic patients [12], the lack of paediatric formulations of tinidazole has pushed this drug to a second-line position when referring to children. Although treatment is generally effective and well-tolerated, it is generally recommended to confirm eradication, and persistent infection should be suspected if symptoms recur. The proportion of treatment failure with nitroimidazoles ranges from 5.8% to 22% in the adult population [6,7,13,14]. Some series including both children and adults have reported similar treatment failure rates [7,13]. Unfortunately, series exclusively describing paediatric populations are scarce, as well as clinical trials that compare the efficacy of diverse drug regimens [13,15,16].

The causes of first-line treatment failure are unclear. Re-infection might underlie some cases, and the presence of certain mucosal immunosuppression has been suggested as an etiologic explanation [10]. However, the most accepted hypothesis suggests that adherence problems and/or drug malabsorption secondary to mucosal damage can lead to treatment failure [10]. Despite scarce evidence, retreatment with metronidazole at a higher dose (45 mg/kg/day every 8 hours for 10 days), similar to that for amoebiasis, is recommended [10,17]. Most authors would also consider nitazoxanide, quinacrine or albendazole as alternative regimens in cases of treatment failure [13,15,18].

This study aims to describe the clinical presentation of intestinal giardiasis among children from various areas of the Bukhara. We aim to estimate the prevalence of refractory GI infection among paediatric patients, to identify risk factors for treatment failure and to analyse the safety and effectiveness of second- and third-line treatment strategies.

Materials and methods.

Inclusion criteria: the age from 3 to 15 years old, the giardiasis confirmation by the results of coprological investigation, the absence of allergic reactions to nitroimidazole preparations in the

anamnesis. All the patients were examined according to a single scheme, which included a complex of clinical and laboratory tests, interview and examination of the patient. Clinical manifestations of the disease were evaluated before treatment, on the 5th day of therapy and immediately after the end of the course of treatment. Determination of clinical and biochemical blood parameters before the start of treatment and immediately after the end of treatment. The diagnosis was verified on the basis of clinical and anamnestic findings and laboratory data (fecal coproscopy).

Results and discussion.

The comparative analysis of the clinical and laboratory parameters in the examined patients with giardiasis before conventional treatment was carried out.

Analyzing clinical symptomatology of the patients studied, we found disorders of general state in the form of asthenovegetative syndrome (76% and 70% of cases); gastrointestinal damage syndrome (64% and 54%); toxic-allergic syndrome (33% and 38%) - in the main and control groups respectively.

After taking 15-day course of preparation "Metronidazole" all patients had improvement of general state and well-being (in the form of decrease of weakness), appetite was improved. In the control group, after taking "Albendazole" during 7 days, the dynamics of symptoms was insignificant. In the group of patients who received "Metronidazole" the manifestations of asthenovegetative syndrome were less expressed than in the control group. The phenomena of weakness and headache in the patients of the main group were twice less than in the control group. Dynamics of changes in the indicators of toxic-allergic syndrome in the main group is more dynamic, complete relief of skin itching was noted.

Since the efficacy of the treatment in the control group didn't exceed 38%, the patients were repeatedly treated. Further, 21 days after treatment the efficacy of the antilymbias therapy was evaluated on the basis of the results of repeated examination of the stool for giardia cysts. In the main group, a repeated excretion of giardia cysts was observed in only 2 (4%) and in the control group in 8 (16%). In 3 months after treatment, the efficacy of antilymbias therapy was further evaluated according to the results of repeated examination of stool for giardia cysts. Fecal coprological examination was positive in the main group in 8% of cases in the main group and in 16% of cases in the control group, respectively. The presented indicators of sanitation of the organism from protozoa, being 92% in the main group against 84% in the control group, along with indicators of the prospective effect in 3 months after the treatment (positive coproscopy - 2% and 16%, correspondingly) indicate high effect of therapy with "Metronidazole" in combination with albendazole.

Conclusions

Results from this paediatric series show a high prevalence of asymptomatic cases among children with giardiasis, suggesting that screening for giardia in patients arriving from areas with high prevalence is mandatory in order to prevent long-term consequences such as malnutrition and cognitive retardation. Treatment with metronidazole was well tolerated, but treatment failure reached 20%.

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